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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/061,305	02/04/2002	Ryosuke Kosaka	8023-1001	2358

466 7590 02/03/2004

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EXAMINER	
LEFLORE, LAUREL E	
ART UNIT	**PAPER NUMBER**
2673	

DATE MAILED: 02/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/061,305	KOSAKA, RYOSUKE	
	Examiner	Art Unit	
	Laurel E LeFlore	2673	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 5-10 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nitta et al. 6,661,402 B1 in view of Usui et al. 5,844,533.

In regard to claims 1 and 8, Nitta et al. discloses a signal line driving circuit of a liquid crystal display for applying a pre-charging voltage and a gradation voltage corresponding to a picture data to a plurality of signal lines. See column 1, lines 56-67, disclosing, "There is provided in the output amplifier circuit of a liquid crystal driver circuit, means for switching between an amplifier circuit that amplifies a predetermined gray-scale voltage for output and an amplifier circuit that amplifies a predetermined gray-scale voltage by a factor of 1 for buffering and outputs it with no amplification. For a predetermined part of the horizontal period, the liquid crystal panel is driven by the amplified output and, for the rest of the period, by the buffered output. In addition, a pre-charge control circuit is provided to check whether the gray-scale voltage is to be amplified depending upon the display data." Thus, Nitta et al. discloses an amplified voltage that is a pre-charge voltage and a gradation voltage that not amplified. Further see figure 7, depicting a plurality of signal lines.

The invention of Nitta et al. comprises a switch controller for controlling a supply of the pre-charging voltage in accordance with a result compared by the picture data comparator. See figure 7 and column 10, lines 41-45, disclosing, "The pre-charge control circuit 735 checks the display data 723 of each output to decide whether to perform pre-charging corresponding to the gray-scale voltage shown in FIG. 11 and generates the pre-charge validity signal 736." Thus, Nitta et al. discloses a picture data comparator. See column 11, lines 23-26, disclosing, "In addition, as shown in FIG. 8, switching SW1-SW6 via the pre-charge timing signal 721 and the pre-charge validity signal 736 switches the circuit between the amplifier circuit and the voltage follower circuit for output." Thus, a switch controller for controlling a supply of the pre-charging voltage in accordance with a result compared by the picture data comparator is disclosed.

Nitta et al. does not disclose that the picture data comparator compares picture data before one horizontal period with picture data to be next displayed for each signal line. However, the invention of Usui et al. discloses in column 2, lines 4-15, "The liquid crystal display apparatus compares display data for the current screen with that for the immediately previous screen, generates gray scale data for N times in accordance with the comparison result, and presents a gray-scaled image based on the generated gray scale data. The response speed of liquid crystals can therefore be improved significantly." Also see column 1, lines 64-66, disclosing "gray scale data generating means for

comparing a current video signal with a previous video signal of a predetermined period before".

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the invention of Nitta et al. with the invention of Usui et al. by comparing picture data of the current display with that for the immediately previous display in order to control a pre-charge voltage. One would have been motivated to make such a change based on the teaching of Usui et al. that with such a comparison, "The liquid crystal display apparatus...can therefore accomplish quick response and high image quality even with a simple matrix structure."

3. In regard to claims 2 and 9, Usui et al. discloses that the switch controller does not apply the pre-charging voltage if the gradation voltage of the picture data to be next displayed is within a certain range of the gradation voltage of the picture data before one horizontal period. See column 19, lines 28-37, disclosing that if "the current image data has been changed from the image data of the previous frame in a specific range...The selector 325 outputs the image data, which has been received at the input terminal J from the ROM 324 and has a gray scale with slightly greater emphasis put on the degree of change, from the output terminal P." Note that this is different from the maximum or minimum gray-scale voltages of cases iii) and iv), disclosed in column 19 of Usui et al. In cases iii) and iv), there is a large difference between the current and previous image data,

and the selector consequently outputs a maximum or minimum gray scale value, which is a pre-charge voltage.

Also, note column 10, lines 46-50 of Nitta et al.'s invention, which discloses, "For example, out of 256 gradations from gradations 1-256, pre-charging is performed not for gradations 1-64 but for gradations 65-256." Thus, the pre-charge voltage is to applied to gradation voltages within a certain range.

4. In regard to claims 3 and 10, Usui et al. discloses that the switch controller does not apply the pre-charging voltage if the gradation voltage of the picture data to be next displayed agrees with the gradation voltage of the picture data before one horizontal period. See column 19, lines 20-27, disclosing, "In the case of [switch] S0='0' and [switch] S1='1', There is no change in the gray scale because the current image data...and the image data of the previous frame have the same gray scale. The selector outputs the current image data...without any change." Thus, no pre-charge voltage is applied.
5. In regard to claims 5, 6, 12 and 13, Nitta et al. in view of Usui et al. discloses that the switch controller applies the pre-charging voltage if a polarity of the gradation voltage of the picture data to be next displayed is different from a polarity of the gradation voltage of said picture data before one horizontal period. See column 10, lines 56-58 of Nitta et al., disclosing, "the selection circuit 726 selects display data depending upon whether the neighboring output is in the positive polarity or negative polarity."

6. In regard to claims 7 and 14, see rejection of claims 1 and 8. Nitta et al. in view of Usui et al. further discloses that the switch controller applies the gradation voltage by using a first operational amplifier suitable for a boosting operation if the gradation voltage of the picture data to be next displayed is higher than the gradation voltage of the picture data before one horizontal period. See Nitta et al., figure 8 and column 11, lines 26-28, disclosing, "AMP1 is an amplifier circuit which outputs the positive-polarity gray-scale voltage (charge current)."

Nitta et al. in view of Usui et al. further discloses that the switch controller applies the gradation voltage by using a second operational amplifier suitable for a voltage drop operation if the gradation voltage of the picture data to be next displayed is lower than the gradation voltage of the picture data before one horizontal period. See Nitta et al., figure 8 and column 11, lines 36-38, disclosing, "AMP2 is an amplifier circuit which outputs the negative-polarity gray-scale voltage (discharge current)."

Nitta et al. in view of Usui et al. further discloses that the switch controller applies the gradation voltage by using any one of the first and second operational amplifiers if the gradation voltage of the picture data to be next displayed is equal to the gradation voltage of the picture data before one horizontal period. See Nitta et al., column 11, lines 26-43, disclosing that either of the first and second amplifier circuits can be used to output voltage without amplification (pre-charge voltage).

7. Claims 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nitta et al. 6,661,402 B1 in view of Usui et al. 5,844,533 as applied to claims 1, 8 and 9 above, and further in view of Liaw et al. 6,483,494 B1.

In regard to claims 4 and 11, Nitta et al. in view of Usui et al. disclose an invention similar to that which is claimed in claims 4 and 11. See rejections of claims 1 and 8 for similarities. Nitta et al. in view of Usui et al. does not disclose that the switch controller applies the pre-charging voltage only if a polarity of the gradation voltage of the picture data to be next displayed is different from a polarity of the gradation voltage of the picture data before one horizontal period.

Liaw et al. discloses an invention in which the polarity is reversed in each frame, and the pre-charge voltage is applied according to the polarity. See column 3, line 64 to column 4, line 4, disclosing, "the pre-charged voltage is charged, stage by stage, to a proper determined voltage value (for example, 7.5 volts for positive polarity and 2.5 volts for negative polarity). In addition, the polarity-alternating pre-charge indicates that the first charge storage line L.sub.1 151 charges a frame to positive polarity and then charges a next frame to negative polarity." Liaw et al. teaches in column 2, lines 45-49, that an object of such a method is "to provide a multistage charging driving circuit for liquid crystal displays, characterized in having better accuracy in median gray-scale voltage and lower power dissipation, preventing the latch up at the output of the driving circuit."

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Nitta et al. in view of Usui et al. by having the switch controller apply the pre-charging voltage only if a polarity of the gradation voltage of the picture data to be next displayed is different from a polarity of the gradation voltage of the picture data before one horizontal period, as in the invention of Liaw et al. One would have been motivated to make such a change based on the teaching of Liaw et al. in column 2, lines 45-49, that such a method would "provide a multistage charging driving circuit for liquid crystal displays, characterized in having better accuracy in median gray-scale voltage and lower power dissipation, preventing the latch up at the output of the driving circuit."

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ueno et al. 6,320,562 B1 discloses an invention that applies a compensation voltage based on a comparison of display data.

Mizumaki 6,333,727 B2 discloses an invention which determines whether or not to update display by storing data and comparing it to data for next display.

Mori JP08-340505 A discloses an invention which compares consecutive image data in order to determine an output voltage.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laurel E LeFlore whose telephone number is (703) 305-8627. The examiner can normally be reached on Monday-Friday 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on (703) 305-3885. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

LEL